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IN THE UNI1450TED STATES PATENT AND TRADEMARK OFFICE

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Applicant(s): Sung-Ho CHOI et al. Examiner: Moore, Ian N.

Serial No.: 09/888,914 Group Art Unit: 2661

Filed: June 25, 2001 Docket: 678-694 (P9830)

For: APPARATUS AND METHOD FOR SYNCHRONIZATION TRANSMISSION SCHEME IN A CDMA COMMUNICATION SYSTEM

Dated: February 22, 2006

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

TRANSMITTAL OF APPELLANT'S BRIEF ON APPEAL

Sir:

Enclosed please find APPELLANT'S BRIEF.

Also enclosed is a check in the amount of $500.00 to cover the appeal fee.

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Respectfully submitted,

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Paul J. Farrell

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants:	Sung-Ho CHOI et al.	Group Art Unit:	2661
Serial No.:	09/888,914	Examiner:	MOORE, Ian N.
Filed:	June 25, 2001	Docket:	678-694 (P9830)

For: **APPARATUS AND METHOD FOR SYNCHRONIZATION OF UPLINK SYNCHRONOUS TRANSMISSION SCHEME IN A CDMA COMMUNICATION SYSTEM**

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

REAL PARTY IN INTEREST

The real party in interest is Samsung Electronics Co., Ltd., the assignee of the subject application, having an office at 416, Maetan-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea.

RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge and belief, there are no currently pending related appeals, interferences or judicial proceedings.

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8 (a)

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Dated: February 22, 2006

Paul J. Farrell

STATUS OF CLAIMS

Of Claims 1-24, Claims 4-7, 9, 14-17 and 20 are objected to and Claims 1-3, 8, 10-13, 18-19 and 21-24 stand finally rejected. All of the claims, 1-24, are the subject of this appeal. A copy of the appealed claims is contained in the Claims Appendix. For the purposes of this appeal, Claims 2-9 stand or fall together with Claim 1, Claims 12-20 stand or fall together with Claim 11, Claims 22-24 stand or fall together with Claim 21, and Claim 10 does not stand or fall with any of the other claims. Claims 1, 10, and 21 are method claims and Claim 11 is an apparatus claim.

STATUS OF AMENDMENTS

The Amendment filed on November 22, 2005 in which Claims 10, 11, and 21 were amended, has been entered for the purposes of this appeal. (See, Advisory Action dated December 8, 2005). There have been no amendments filed subsequent to the amendments to Claims 10, 11 and 21 filed in the November 22, 2005 Amendment in response to the final rejection set forth in the Office Action mailed August 23, 2005.

SUMMARY OF CLAIMED SUBJECT MATTER

The present application relates to a method and an apparatus for synchronization of an uplink (UL) signal receiving time, and more particularly, teaches a Node "B" provides a user equipment (UE) with a transmission time adjustment value (e.g., see specification, page 12, top; and FIGs. 1 and 3) and the UE uses a scrambling code offset calculated using the adjustment value.

As defined by Claim 1, the present invention is drawn to a method for synchronizing a scrambling code in a CDMA (Code Division Multiple Access) communication system including a UTRAN (UMTS (Universal Mobile Telecommunications System) Terrestrial Radio Access Network) and a plurality of user equipments (UEs), using orthogonal codes for identifying the UEs and a single up-link scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing. The method teaches receiving, in the UTRAN, the random access channel signal from a UE to measure a propagation delay time (PD) of the UE, and transmitting a transmission time adjustment value calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH). The method further teaches determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value, and scrambling a frame data with an orthogonal code and a scrambling code generated at a time being different from a generating time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

As defined by claim 10, the present invention is also drawn to a method for synchronizing a scrambling code in a UE of a CDMA communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a

single uplink scrambling code for the UEs to identify the UTRAN and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing. The method teaches determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal. The method further teaches creating a scrambling code at the system timing. The method further teaches creating a data frame at the determined transmission time, and scrambling, at the determined transmission time, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

As defined by Claim 11, the present invention is drawn to an apparatus for synchronizing a scrambling code in a UE of a CDMA communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a single uplink scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing. In the apparatus, a controller determines a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal. In

the apparatus, a scrambling code generator creates a scrambling code at the system timing, and a frame generator creates a data frame at the determined transmission time. A scrambler scrambles, at the transmission time determined by the controller, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value at the system time.

As defined by Claim 21, the present invention is drawn to a method for data transmission in a communication system. The method teaches receiving, at a network, a Random Access Channel (RACH) transmitted from a User Equipment (UE). The method teaches calculating a transmission time adjustment value for the UE, transmitting the transmission time adjustment to the UE, and receiving, at the UE, the transmission time adjustment value. The method further teaches calculating a starting timing of an uplink frame, generating an orthogonal code for spreading the uplink frame at the starting timing of the uplink frame, generating a scrambling code for scrambling code for scrambling the uplink frame at a predetermined timing, and transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 8, 10-11, 18-19, and 21 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,930,244 (hereinafter Ariyoshi) and Claims 2-3, 12-13, and 22-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ariyoshi in

view of U.S. Patent No. 5,839,052 (hereinafter Dean).

ARGUMENT

I. ARIYOSHI FAILS TO ANTICIPATE THE INVENTION AS CLAIMED IN CLAIM 1.

Independent Claim 1 was said to be anticipated by Ariyoshi. (See, paragraph 3, at page 3, of the Office Action dated August 23, 2005 and paragraph 1 at page 2 of the Advisory Action dated December 8, 2005.)

Ariyoshi relates to a CDMA (code division multiple access) communication system and a control method of tracking the phases of spreading codes (Column 1, lines 6-9). Moreover, Ariyoshi teaches synchronization control of received signals of other terminal stations is executed, and therefore received signals of all terminal stations reach the base station in an orthogonal state with each other (Column 9, Lines 2-5). In other words, Ariyoshi teaches using phase difference information (e.g., see Column 2, Lines 55-60) and transmitting signals from terminal stations such that they all arrive at the base station <u>at the same time</u>, thus maintaining their orthogonality. Moreover, Ariyoshi teaches "[i]n order to utilize the advantages of orthogonal codes, it is necessary to assure perfect synchronization of orthogonal code timings [sic]," and that "[i]f there is any <u>shifts of timings</u> [sic] of orthogonal codes,"… "orthogonality is lost" and a "signal-to-noise (S/N) radio is degraded" (Ariyoshi, Column 1, Line 61—Column 2, Line 3—emphasis added). Moreover, Ariyoshi teaches that receiving signals from each terminal station asynchronously at the base station causes a degradation of the S/N ratio (Ariyoshi,

Column 2, Lines 4-10).

The present application relates to an apparatus and a method for assigning codes for synchronization of an uplink signal receiving time in an Uplink Synchronous Transmission Scheme (USTS) (Specification, Page 7). The present invention further discloses the transmission times of uplink (UL) dedicated signals sent from *n* different user equipments (UEs) are transmitted at different times synchronized with each other (e.g., see, Specification, Page 12; and Time Modified n^{th} and $n+1^{th}$ UL DPCHs, 303, and 306, respectively, in FIG. 3 of the present application, which are transmitted at different times). The unique time offset (i.e., transmission at different times) is desirable for the transmission of downlink DPCH's because it minimizes difficulties (such as noise and signal loss) which can occur when "control parts" of these signals are transmitted at the same time (Specification, Page 4). Moreover, according to the present invention, uplink (UL) dedicated physical channels (DPCHs) (e.g., see FIGs. 2 and 3) also have "frame ends" which arrive at node B (e.g., see FIG. 1) at different times. (Specification, Page 4.)

Thus, the present invention, as defined by the Claims, differs from Ariyoshi in that the present invention, as defined by the Claims, teaches transmitting signals at different times.

a. It is the position of the Examiner that Ariyoshi discloses all the limitations of Claim 1[1].

[1] e.g., see the Office Action dated August 23, 2005, pages 3-4, paragraph 3; and Advisory Action dated December 8, 2005.

Claim 1 recites receiving, in the UTRAN, the random access channel signal from a UE to measure a propagation delay time (PD) of the UE, and transmitting a transmission time adjustment value calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH); and determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value, and scrambling a frame data with an orthogonal code and a scrambling code generated at a time being different from a generating time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

However, Ariyoshi fails to teach or suggest receiving, in the UTRAN, the random access channel signal from a UE to measure a propagation delay time (PD) of the UE, and transmitting a transmission time adjustment value calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH); and determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value, and scrambling a frame data with an orthogonal code and a scrambling code generated at a time being different from a generating time of the frame data with a scrambling code offset calculated from the transmission time adjustment value, as recited in Claim 1.

1. Ariyoshi fails to anticipate at least a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH).

As defined in the specification of the present application, a unique time offset, i.e., the time offset ($\tau_{DPCH,n}$) as recited in Claim 1 (e.g., see, Specification, pp. 2, and 6 and FIGs. 2 and 3) defines a unique time at which a downlink (DL) dedicated physical channel (DPCH) is transmitted by a UTRAN (which has been equated by the Examiner with the base station 401 of Ariyoshi, e.g., see Office Action dated August 23, 2005, page 3). This time offset is more clearly illustrated with reference to FIGs. 2 and 3, which illustrate unique time offsets $\tau_{DPCH,n}$, and $\tau_{DPCH,n+1}$. Thus, the n^{th} downlink DL DPCH 301 is transmitted (by the UTRAN such as node B) at a unique time ($\tau_{DPCH,n}$) after a system timing (e.g., see a common time—Specification, pp. 13 and 14) defined by the start of, for example, a common pilot channel (CPICH) 201 or a primary common control physical channel (P-CCPCH) 203. This system timing is more clearly illustrated with reference to the dashed lines in FIGs. 2 and 3 of the present application (e.g., see Specification, pp. 13 and 14). Likewise, the $n+1^{th}$ DL DPCH is transmitted with a delay (which will be described in detail below) of at least another unique time ($\tau_{DPCH,n+1}$) after the system timing (e.g., see dotted line, as described above, in FIG. 3).

It is asserted that the time offset τ_{DPCH} (e.g., $\tau_{DPCH,n}$ and $\tau_{DPCH,n+1}$), as recited in Claim 1 and which defines a unique time at which a particular DL DPCH <u>is transmitted</u>

by a UTRAN, is anticipated by the phase jump information PJ-i, (Column 4, lines 36-43) as taught by Ariyoshi (e.g., see Office Action dated August 23, 2005, page. 4). However, as taught by Ariyoshi, the phase jump information (PJ-i) is generated in accordance with the contents of acquired phase information (SP-i) (e.g., see Ariyoshi, column 4, lines 26-43) which was generated from a demodulated input Rx signal (e.g., see Column 4, lines 4, 10-13, and 30-32). In other words, the phase jump information (PJ-i) is related to "received data" from each terminal station (e.g., see Column 4, line 12). This "received data" is used by the base station to measure a phase difference between a reception reference phase of a reception signal of each terminal, at each channel on the reverse link (e.g., see Ariyoshi, Column 4, Lines 4-12). Ariyoshi further teaches a phase synchronization control signal generated in accordance with the measured phase difference is fed back to each terminal station (e.g., see id). Thus, the phase jump information (PJ-i) merely relates to received data which is fed back from a base station to a user terminal and cannot anticipate the "time offset," as recited in Claim 1, which refers a the time offset (e.g., $\tau_{DPCH,n}$ and $\tau_{DPCH,n+1}$) of a signal transmitted from a UTRAN (e.g., see FIG. 3).

2. Ariyoshi fails to anticipate a transmission time adjustment value.

The transmission time adjustment value, as recited in Claim 1, has been equated with the phase synchronization control instruction (PC-i) and the phase **difference** information (PD-i) as taught by Ariyoshi in Column 4, Lines 28-32 (See Office Action dated August 23, 2005, pp. 4 and 9).

First, the transmission time adjustment value, as recited in Claim 1, is calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ (which was discussed above and is not anticipated by Ariyoshi) between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH). Accordingly, Ariyoshi cannot anticipate the transmission time adjustment value.

Second, the phase control instruction (PC-i) or the phase difference information (PD-i), as taught by Ariyoshi, either alone or in combination, does not anticipate the transmission time adjustment value, as recited in Claim 1, for the following reasons.

As discussed above, the transmission time adjustment value is calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing (e.g., a common time such as shown by the dotted lines of FIG. 3) and a transmission time point of a downlink dedicated physical channel (DPCH) (e.g., see, for example, the n^{th} DL DPCH 301 of FIG. 3). Using this value (i.e., the transmission time adjustment value), a transmission time of a Time Modified n^{th} UL DPCH 303 is determined. Although calculations for determining the transmission time adjustment value are at least in part described on pages 9-13 of the present application, for the sake of clarity, reference is made to FIG. 3 of the present application, which illustrates the transmission time of a Time Modified n^{th} UL DPCH 303 determined using the transmission time adjustment value, as recited in Claim 1. Although an n^{th} UL DPCH could be transmitted according to conventional techniques at a time corresponding to the n^{th} UL DPCH 302,

according to the present invention, as recited in Claim 1, the transmission time adjustment value (as recited in Claim 1) is used to adjust the transmission time of the n^{th} UL DPCH such that it is transmitted at a time which corresponds to the Time Modified n^{th} UL DPCH 303, thus ensuring that the n^{th} UL DPCH 303 is "slot synchronized" (e.g., see Specification, page 12).

This concept ensures that an $n+1^{th}$ UE's UL DPCH (e.g., Time Modified UL DPCH 306 in FIG. 3) is "slot synchronized" with the n^{th} UE's UL DPCH (e.g., Time Modified UL DPCH 303 in FIG. 3) and is transmitted by the UE at a different time from the n^{th} UL DPCH. Additionally, with reference to FIG. 3, one skilled in the art would easily see that the n^{th} UL DPCH is received at a different time from the $n+1^{th}$ UL DPCH in accordance with the specification of the present invention (e.g., see Spec, page 4). This concept is fundamentally different from the control method of tracking the phases of spreading codes taught by Ariyoshi (Column 1, lines 5-9) and of receiving signals from different user terminals at the base station at the same time thus maintaining orthogonality, as taught by Ariyoshi.

As taught by Ariyoshi, the phase synchronization control instruction (PC-i) is merely generated in accordance with the contents of phase difference information (PD-i) (Ariyoshi, Column 4, Lines 36-42, and FIGs. 1 and 2) and thus, as it merely relates only to a <u>phase difference</u> of a received signal, it cannot anticipate the transmission time adjustment value, as recited in Claim 1. Moreover, regarding the Examiner's assertion that the phase difference information (PD-i) anticipates the transmission time adjustment

value as recited in Claim 1, it is respectfully submitted that Ariyoshi teaches in Column 6, lines 5-14 a received state decision circuit 213 (e.g., see circuit within dashed lines of FIG. 2 of Ariyoshi) is used for determining the phase of a received signal Rx and that a difference between the sums of respective de-spread results (correlation values) is output as the phase difference information (PD-i). In other words, the phase difference information (PD-i), as taught by Ariyoshi, is, as its name implies, merely phase difference information, and, thus, either alone or in combination with the phase synchronization control instruction (PC-i), cannot anticipate the transmission time adjustment value, as recited in Claim 1 of the present invention.

Accordingly, as Ariyoshi does not teach or suggest the transmission time adjustment value is calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH), Ariyoshi cannot anticipate the transmission time adjustment value, as recited in Claim 1.

3. Ariyoshi does not anticipate determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value.

As discussed above with respect to sections 1 and 2 above, Ariyoshi does not teach or suggest the transmission time adjustment value, as recited in Claim 1. Accordingly, as Ariyoshi does not anticipate the transmission time adjustment value, Ariyoshi cannot anticipate determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value, as recited in

Claim 1.

Moreover, in the Office Action of August 23, 2005, the step of <u>determining</u>, in the UE, a transmission time of the uplink physical channel signal, a distinguishing element of the present invention, was not addressed by the Examiner. Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) is warranted.

Furthermore, although the transmission time of the uplink physical channel signal (e.g., see 303 and 305, FIG. 1 of the present application) has been equated with the transmission phase controller 315, as taught by Ariyoshi (e.g., see, Office Action, Page 4), the transmission phase controller, as taught by Ariyoshi, merely outputs a control signal (PS-i) for fine adjustment of the phases of orthogonal code Wi and pseudo noises PNr (e.g., see Ariyoshi, Column 6, Lines 60-65). In other words, the control signal PS-i merely controls a fine adjustment of the phases of the pseudo noise PNr and the orthogonal signal Wi which are mixed with Transmitting Data 316 (see FIG. 3 where PS-i merely controls delay 319, Ariyoshi). However, Ariyoshi is silent on the control signal PS-i controlling a transmission time of the Transmitting Data 316. The transmission time of the uplink signals (e.g., see, UL DPCCH in FIG. 3 of the present invention) is a distinguishing element of the present invention and is neither taught nor suggested by Ariyoshi.

<u>4. Ariyoshi does not teach or suggest scrambling a frame data with an orthogonal code and a scrambling code with a scrambling code offset calculated from the transmission time adjustment value.</u>

It is asserted by the Examiner that the frame data, as recited in Claim 1, is anticipated by the "radio data frame" from encoder 317 (Office Action, Page 4). Upon review of Ariyoshi, a "radio data frame" was not found. However, Ariyoshi does teach an encoder 317 which inputs transmission data 316 to be encoded and "thereafter spectrum-spread by two multipliers 320 and 322" (Ariyoshi, Column 7, Lines 25-27; and FIG. 3). However, Ariyoshi does not provide any information on when the data is encoded for transmission (or a "frame", as the Examiner asserts is formed by the encoder 317). Rather, Ariyoshi merely teaches encoded data is spectrum spread by the two multipliers (which multiply the encoded data with Wi and PNr, as shown in FIG. 3) and teaches controlling the phases of the inputs to the multipliers (i.e., Wi and PNr).

As discussed above with respect to sections 1, 2, and 3, Ariyoshi does not anticipate the transmission time adjustment value, as recited in Claim 1. Therefore, Ariyoshi cannot anticipate (1) a scrambling code offset <u>calculated</u> from the transmission time adjustment value, and (2) a scrambling code generated at a time being different from a generating time of the frame data with a scrambling code offset calculated from the transmission time adjustment value, as recited in Claim 1.

However, even assuming that Ariyoshi were found to anticipate the transmission time adjustment value, Ariyoshi still does not anticipate the step of <u>calculating</u> (a scrambling code offset) from the transmission time adjustment value, as recited in Claim 1. The scrambling code offset has been equated with the control signal (PS-i) output

from controller 315 to finely adjust the phases (i.e., the phases of PNr and Wi) (e.g., see Office Action dated August 23, 2005, Page 5; and Ariyoshi, Column 7, Lines 38-44; and FIG. 3). In other words, the control signal PS-i merely finely adjusts phases of the PNr and Wi output from the PN generator 321 and the orthogonal code generator 318, using delay circuits 319' and 319, respectively. However, in contrast to that which is taught by Ariyoshi, the step of calculating (a scrambling code offset) from the transmission time adjustment value is used to find a scrambling code offset. This scrambling code offset is more clearly illustrated with reference to pages 15 and 16 of the present Specification which discloses the (scrambling code) offset value is calculated by: offset = $\tau_{DPCH,n} + T_o + 2*PD + L$. For example, the present Specification discloses a scrambling code offset scrambling code D(i)=C((i+offset)modulo 38400) on Page 15. Thus, according to the present invention, by using the (scrambling code) offset value, a start point of scrambling code does not have to be time-aligned (i.e., start at the same time as the start point of frame data (e.g., UL DPCH, e.g., see Specification, Page 13). This concept is fundamentally different from the phase control method of Ariyoshi, where the control signal (PS-i) output from controller 315 finely adjusts the phases (i.e., the phases of PNr and Wi) (e.g., see Office Action dated August 23, 2005, Page 5; and Ariyoshi, Column 7, Lines 38-44; and FIG. 3).

Therefore, Ariyoshi does not anticipate either or both of the scrambling code offset or the scrambling code with a scrambling code offset calculated from the transmission time adjustment value, as recited in Claim 1.

II. ARIYOSHI FAILS TO ANTICIPATE THE INVENTION AS CLAIMED IN CLAIM 10.

Independent Claim 10 is said to be anticipated by Ariyoshi[2]. As stated above with respect to Claim 1, Ariyoshi relates to a CDMA (code division multiple access) communication system and a control method of tracking the phases of spreading codes. Ariyoshi teaches synchronization control of received signals is executed, and therefore received signals of all terminal stations reach the base station in an orthogonal state (Column 9, Lines 2-5). In other words, Ariyoshi teaches using phase difference information (e.g., see Column 2, Lines 55-60) and transmitting orthogonal signals from terminal stations such that they all arrive at the base station at the same time, thus maintaining their orthogonality. It is the position of the Examiner that Ariyoshi discloses all the limitations of Claim 10[3].

Claim 10 recites determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal, creating a scrambling code at the system timing, creating a data frame at the determined transmission time, and scrambling, at the determined transmission time, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

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[2] e.g., see the Office Action dated August 23, 2005, pages 3-4, paragraph 3;and Advisory Action dated December 8, 2005.
[3] See Office Action dated August 23, 2005, pp 3-5.

However, Ariyoshi fails to teach or suggest determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal, creating a scrambling code at the system timing, creating a data frame at the determined transmission time, and scrambling, at the determined transmission time, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

1. Ariyoshi fails to disclose determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN.

Claim 10 recites a transmission time adjustment value for slot synchronization.

In the Office Action of August 23, 2005, a transmission time adjustment value for slot synchronization, a distinguishing element of the present invention, was not addressed by the Examiner. Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) is warranted.

2. Ariyoshi fails to anticipate at least creating a data frame at the determined transmission time.

Claim 10 recites creating a data frame at the determined transmission time.

For at least the same reasons as set forth above in Section I.4., with respect to

Claim 1, Ariyoshi does not disclose creating a data frame at the determined transmission time as recited in Claim 10.

<u>3. Ariyoshi fails to anticipate a scrambling code offset calculated from the transmission time adjustment value.</u>

Claim 10 recites a scrambling code offset calculated from the transmission time adjustment value.

For at least the same reasons as set forth above in Section I.4., with respect to Claim 1, Ariyoshi does not disclose a scrambling code offset calculated from the transmission time adjustment value, as recited in Claim 10.

<u>4. Ariyoshi fails to anticipate scrambling the data frame with the scrambling code with a scrambling code offset calculated from the transmission time adjustment value.</u>

For at least the same reasons as set forth above in Section I.4., with respect to Claim 1, Ariyoshi does not disclose scrambling the data frame with the scrambling code with a scrambling code offset calculated from the transmission time adjustment value, as recited in Claim 10.

Accordingly, as Ariyoshi does not anticipate Claim 10, the rejection under 35

U.S.C. §102(b) of Claim 10 must be withdrawn.

III. ARIYOSHI FAILS TO ANTICIPATE THE INVENTION AS CLAIMED IN CLAIM 11.

Independent Claim 11 is said to be anticipated by Ariyoshi[4].

As stated above with respect to Claim 1, Ariyoshi relates to a CDMA (code division multiple access) communication system and a control method of tracking the phases of spreading codes. Ariyoshi teaches synchronization control of received signals is executed, and therefore received signals of all terminal stations reach the base station in an orthogonal state (Column 9, Lines 2-5). In other words, Ariyoshi teaches using phase difference information (e.g., see Column 2, Lines 55-60) and transmitting orthogonal signals from terminal stations such that they all arrive at the base station at the same time, thus maintaining their orthogonality. It is the position of the Examiner that Ariyoshi discloses all the limitations of Claim 11[5].

Claim 11 recites a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal, a scrambling code generator for creating a scrambling code at the system timing, a frame generator for creating a data frame at the determined transmission time, and a scrambler for scrambling, at the transmission time

[4] e.g., see the Office Action dated August 23, 2005, pages 3-4, paragraph 3;and Advisory Action dated December 8, 2005.

[5] See Office Action dated August 23, 2005, pp 3-5.

determined by the controller, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value at the system time.

However, Ariyoshi fails to teach or suggest a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal, a scrambling code generator for creating a scrambling code at the system timing, a frame generator for creating a data frame at the determined transmission time, and a scrambler for scrambling, at the transmission time determined by the controller, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value at the system time.

1. Ariyoshi fails to teach or suggest a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN.

Claim 11 recites a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN.

For at least the same reasons as set forth above in Section I.3., above with respect to Claim 1, Ariyoshi fails to teach or suggest a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from

the UTRAN, as recited in Claim 11.

2. Ariyoshi fails to teach or suggest a frame generator for creating a data frame at the determined transmission time.

Claim 11 recites a frame generator for creating a data frame at the determined transmission time.

For at least the same reasons as set forth above in Section I.4., with respect to Claim 1, Ariyoshi does not disclose a frame generator for creating a data frame at the determined transmission time, as recited in Claim 11.

3. Ariyoshi fails to teach or suggest a scrambler for scrambling the data frame with the scrambling code with a scrambling code offset calculated from the transmission time adjustment value at the system time.

Claim 11 recites a scrambler for scrambling the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value at the system time.

For at least the same reasons as set forth above in Section I.4., above with respect to Claim 1, Ariyoshi fails to teach or suggest a scrambler for scrambling the data frame with the scrambling code with a scrambling code offset calculated from the transmission

time adjustment value at the system time, as recited in Claim 11.

Accordingly, as Ariyoshi does not anticipate Claim 11, the rejection under 35 U.S.C. §102(b) of Claim 11 must be withdrawn.

IV. ARIYOSHI FAILS TO ANTICIPATE THE INVENTION AS CLAIMED IN CLAIM 21.

Independent Claim 21 is said to be anticipated by Ariyoshi[6]. Ariyoshi relates to a CDMA (Code Division Multiple Access) communication system and a control method of tracking the phases of spreading codes. Ariyoshi teaches synchronization control of received signals is executed, and therefore received signals of all terminal stations reach the base station in an orthogonal state (Column 9, Lines 2-5). In other words, Ariyoshi teaches using phase difference information (e.g., see Column 2, Lines 55-60) and transmitting orthogonal signals from terminal stations such that they all arrive at the base station at the same time, thus maintaining their orthogonality. It is the position of the Examiner that Ariyoshi discloses all the limitations of Claim 21[7].

Claim 21 recites receiving, at a Network, a Random Access Channel (RACH) transmitted from a User Equipment (UE), calculating a transmission time adjustment value for the UE, transmitting the transmission time adjustment to the UE, receiving, at the UE, the transmission time adjustment value, calculating a starting timing of an uplink frame, generating an orthogonal code for spreading the uplink frame at the starting timing

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[6] e.g., see the Office Action dated August 23, 2005, pages 3-6, paragraph 3;and Advisory Action dated December 8, 2005.

[7] See Office Action dated August 23, 2005, pp3-5.

of the uplink frame, generating a scrambling code for scrambling code for scrambling the uplink frame at a predetermined timing, and transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

However, Ariyoshi fails to teach or suggest receiving, at a Network, a Random Access Channel (RACH) transmitted from a User Equipment (UE), calculating a transmission time adjustment value for the UE, transmitting the transmission time adjustment to the UE, receiving, at the UE, the transmission time adjustment value, calculating a starting timing of an uplink frame, generating an orthogonal code for spreading the uplink frame at the starting timing of the uplink frame, generating a scrambling code for scrambling code for scrambling the uplink frame at a predetermined timing, and transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

1. Ariyoshi fails to teach or suggest calculating a transmission time adjustment value for the UE.

Claim 21 recites calculating a transmission time adjustment value for the UE. For at least the same reasons as set forth above in Section I. 2., above with respect to Claim 1, Ariyoshi fails to teach or suggest calculating a transmission time adjustment value for the UE, as recited in Claim 21.

2. Ariyoshi fails to teach or suggest transmitting the transmission time adjustment to the UE.

Claim 21 recites transmitting the transmission time adjustment to the UE. For at least the same reasons as set forth above in Section I.2., above with respect to Claim 1, Ariyoshi fails to teach or suggest transmitting the transmission time adjustment to the UE, as recited in Claim 21.

3. Ariyoshi fails to teach or suggest receiving, at the UE, the transmission time adjustment value.

Claim 21 recites receiving, at the UE, the transmission time adjustment value.

For at least the same reasons as set forth above in Section I.2., above with respect to Claim 1, Ariyoshi fails to teach or suggest receiving, at the UE, the transmission time adjustment value, as recited in Claim 21.

4. Ariyoshi fails to teach or suggest calculating a starting timing of an uplink frame.

Claim 21 recites calculating a starting timing of an uplink frame.

The Examiner alleges that the step of calculating a starting timing of an uplink frame, is disclosed by "a first time when a combined system of Orthogonal code generator 318 and DLY (time delay) 319 generates orthogonal code" (Office Action,

dated August 23, 2005, page 6), and is allegedly disclosed by Ariyoshi in Column 7, Lines 25-67 (Office Action dated August 23, 2005, page 6). However, as stated previously with respect to the rejection of Claim 1 (e.g., in section I.4.), Ariyoshi does not provide any information on when an uplink frame is encoded for transmission. Rather, Ariyoshi merely teaches encoded data is spectrum spread by the two multipliers (which multiply the encoded data with Wi and PNr, as shown in FIG. 3) and teaches controlling the phases of the inputs to the multipliers (i.e., Wi and PNr) (e.g., see Ariyoshi, Column 7, Lines 25-44). Thus Ariyoshi merely teaches multiplying encoded data from an encoder 317 (see, for example, Office Action dated August 23, 2005, Pages 4, bottom - Page 5 top, "scrambling a frame data" using "scrambling code" "322 (i.e., scramble/PN code) scrambles the encoded frame "with a scrambling code").

In contrast with that which is taught by Ariyoshi, Claim 21 recites calculating a starting timing of an uplink frame. The starting timing of the uplink frame (for example a UL DPCCH) is more clearly illustrated with reference to FIG. 3 of the present invention, where a calculated starting timing point of an n^{th} UE corresponds with the beginning of slot #3 (e.g., see UL DPCH 303 and slot 313), and a starting timing point of an $n+1^{th}$ UE corresponds with the beginning of slot # 4. Thus the calculated starting timing of uplink frames of different UE's are received at different times in accordance with an Asynchronous Communication System.

<u>5. Ariyoshi fails to teach or suggest transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.</u>

Claim 21 recites transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

As discussed above with respect to section IV. 4, Ariyoshi does not anticipate the starting timing of the uplink frame. Accordingly, Ariyoshi cannot anticipate transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

For at least the above-discussed reasons, Ariyoshi does not anticipate Claim 21. Thus, the rejection under 35 U.S.C. §102(b) of Claim 21 must be withdrawn.

CONCLUSION

As Ariyoshi does not teach or suggest each and every element of Claims 1, 10, 11, and 21, Ariyoshi cannot anticipate any of Claims 1, 10, 11, and 21. Accordingly, the rejection of Claims 1, 10, 11, and 21 must be reversed.

Independent Claims 1, 10, 11, and 21 are not anticipated by Ariyoshi. Thus, independent Claims 1, 10, 11, and 21 are allowable.

Accordingly, as Claims 1, 10, 11, and 21 are allowable, dependent Claims 2-9, 12-20, and 22-24 are allowable because of their dependence upon independent Claims 1,

11, and 21, respectively.

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CLAIMS APPENDIX

1. (Previously Presented) A method for synchronizing a scrambling code in a CDMA (Code Division Multiple Access) communication system including a UTRAN (UMTS (Universal Mobile Telecommunications System) Terrestrial Radio Access Network) and a plurality of user equipments (UEs), using orthogonal codes for identifying the UEs and a single up-link scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing, comprising the steps of:

receiving, in the UTRAN, the random access channel signal from a UE to measure a propagation delay time (PD) of the UE, and transmitting a transmission time adjustment value calculated using the measured propagation delay time and a time offset $\tau_{DPCH,n}$ between the system timing and a transmission time point of a downlink dedicated physical channel (DPCH); and

determining, in the UE, a transmission time of the uplink physical channel signal by receiving the transmission time adjustment value, and scrambling a frame data with an orthogonal code and a scrambling code generated at a time being different from a generating time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

2. (Previously Presented) The method as claimed in claim 1, wherein the system

timing is a starting timing of a common pilot channel (CPICH) signal.

3. (Previously Presented) The method as claimed in claim 1, wherein the system timing is a starting timing of a primary common control physical channel (P-CCPCH) signal.

4. (Original) The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = ($\tau_{DPCH,n}$ + T_o + 2*PD) mod 2560

where T_o is a constant value.

5. (Original) The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value =2560 - [($\tau_{DPCH,n}$ + T_o + 2*PD) mod 2560]

where T_o is a constant value.

6. (Original) The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = ($\tau_{DPCH,n}$ + T_o + 2*PD) mod 256*m where T_o is a constant value, and m=1,2,3,..,10.

7. (Original) The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(256*m) - [(\tau_{DPCH,n} + T_o + 2*PD) \bmod 256*m]$ where T_o is a constant value, and m=1,2,3,..,10.

8. (Original) The method as claimed in claim 1, wherein the transmission time adjustment value is calculated by subtracting the propagation delay time from a constant value T_o.

9. (Original) The method as claimed in claim 1, wherein the scrambling code offset is calculated by:

offset = $\tau_{DPCH,n} + T_o + 2PD + L$ where L indicates the transmission time adjustment value.

10. (Previously Presented) A method for synchronizing a scrambling code in a UE of a CDMA communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a single uplink scrambling code for the UEs to identify the UTRAN and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing, comprising the steps of:

determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal;

creating a scrambling code at the system timing;

creating a data frame at the determined transmission time; and

scrambling, at the determined transmission time, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the transmission time adjustment value.

11. (Previously Presented) An apparatus for synchronizing a scrambling code in a UE of a CDMA communication system including a UTRAN and a plurality of UEs, using orthogonal codes for identifying the UEs and a single uplink scrambling code for the UEs to identify the UTRAN, and employing an uplink synchronous transmission scheme (USTS) where the UEs synchronize frames of uplink physical channels using the single scrambling code, wherein the UEs receive a signal providing system timing provided from the UTRAN and transmit a random access channel (RACH) signal based on the system timing, the apparatus comprising:

a controller for determining a transmission time upon receipt of a transmission time adjustment value for slot synchronization from the UTRAN in response to the transmitted RACH signal;

a scrambling code generator for creating a scrambling code at the system timing; a frame generator for creating a data frame at the determined transmission time; and

a scrambler for scrambling, at the transmission time determined by the controller, the data frame with the scrambling code generated at a time being different from a transmission time of the frame data with a scrambling code offset calculated from the

transmission time adjustment value at the system time.

12. (Previously Presented) The apparatus as claimed in claim 11, wherein the system timing is a starting timing of a common pilot channel (CPICH) signal.

13. (Previously Presented) The apparatus as claimed in claim 11, wherein the system timing is a starting timing of a primary common control physical channel (P-CCPCH) signal.

14. (Original) The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560 where T_o is a constant value.

15. (Original) The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value =2560 - $[(\tau_{DPCH,n} + T_o + 2*PD)$ mod 2560$]$ where T_o is a constant value.

16. (Original) The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = $(\tau_{DPCH,n} + T_o + 2*PD)$ mod 256*m where T_o is a constant value, and m=1,2,3,..,10.

17. (Original) The apparatus as claimed in claim 11, wherein the transmission time adjustment value is calculated by:

transmission time adjustment value = (256*m) – [($\tau_{DPCH,n}$ + T_o + 2*PD) mod 256*m] where T_o is a constant value, and m=1,2,3,..,10.

18. (Original) The apparatus as claimed in claim 11, wherein the transmission time adjustment value from a constant T_o is calculated by subtracting the propagation delay time from a constant value T_o..

19. (Original) The apparatus as claimed in claim 11, wherein the scrambling code for scrambling the message is delayed by a given scrambling code offset from the scrambling code generated at the system time.

20. (Original) The apparatus as claimed in claim 19, wherein the offset is calculated by:

offset = $\tau_{DPCH,n}$ + T_o + 2PD + L where L indicates the transmission time adjustment value.

21. (Previously Presented) A method for data transmission in a communication system, the method comprising:

receiving, at a Network, a Random Access Channel (RACH) transmitted from a User Equipment (UE);

calculating a transmission time adjustment value for the UE;

transmitting the transmission time adjustment to the UE;

receiving, at the UE, the transmission time adjustment value;

calculating a starting timing of an uplink frame;

generating an orthogonal code for spreading the uplink frame at the starting timing of the uplink frame;

generating a scrambling code for scrambling code for scrambling the uplink frame at a predetermined timing; and

transmitting the uplink frame scrambled and spread by the scrambling code and the orthogonal code with reference to the starting timing of the uplink frame.

22. (Previously Presented) The method as claimed in claim 21, wherein the predetermined timing for the scrambling code is a starting timing of a common pilot channel (CPICH).

23. (Previously Presented) The method as claimed in claim 21, wherein the starting timing of the uplink frame is synchronized with a starting timing of a slot time of a common pilot channel (CPICH).

24. (Previously Presented) The method as claimed in claim 23, wherein the transmission time adjustment value can be adjusted as much as a propagation delay of an uplink and downlink.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to 37 C.F.R. §1.130, §1.131, or §1.132, or entered by the Examiner and relied upon by the Appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 C.F.R. §41.37.